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THOMAS J D'AMICO  
DICKSTEIN SHAPIRO MORIN & OSHINSKY  
2101 L STREET NW  
WASHINGTON, DC 200371526

EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT PAPER NUMBER

1765

DATE MAILED: 10/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/285,773	<b>Applicant(s)</b> MERCALDI ET AL.	
	<b>Examiner</b> Lynette T. Umez-Eronini	<b>Art Unit</b> 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/31/2002.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9,13-15,22-29,33-35,39-83 and 88-93 is/are pending in the application.
  - 4a) Of the above claim(s) 7,9,28,29,42-82 and 88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,9,13-15,22-27,33-35,39-41,83 and 89-93 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 7,9,28,29,42-82, and 88 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some \* c) ☐ None of:
    - 1. ☐ Certified copies of the priority documents have been received.
    - 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group D (claims 1-6, 9, 13-15, 22-27, 33-35, 39-41, 83, and 89-93 in Paper No. 27 is acknowledged. The traversal is on the ground(s) that since the non-elected claims have been previously examined, then it would not be burdensome for the examiner to examine all of the claims of the present invention. This is not found persuasive because an election of species was required because the present applicant contained claims directed to patentably distinct species of the claimed invention of which required as well excluded hydrofluoric acid, nitric acid, propylene glycol, and isopropanol. Also it would be a burdensome to examine the invention having distinct species.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

2. The disclosure is objected to because of the following informalities: The Specification (pages 7-10) fails to show: an etching composition consisting essentially of:

a non-aqueous composition of an alcohol and i. at least two inorganic acid, wherein one of the said inorganic acids is selected from the group consisting of sulfuric, boric, carbonic, perchloric, and sulfurous acid ii. at least two inorganic acids, wherein said inorganic acids are selected from the group consisting of nitric, phosphoric, sulfuric,

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boric, carbonic, perchloric, and sulfurous acid, and iii. at least two different inorganic acids selected from the group consisting of phosphoric, sulfuric, boric, carbonic, perchloric, and sulfurous acid;

a non-aqueous composition of propylene glycol and at least two inorganic acids, wherein one of said inorganic acids is selected from the group consisting of hydrofluoric, phosphoric, sulfuric, boric, carbonic, perchloric, and sulfurous acid;

a non-aqueous composition of an alcohol, sulfuric acid, and at least another inorganic acid;

a non-aqueous composition of an alcohol, boric acid, and at least another inorganic acid;

a non-aqueous composition of an alcohol, perchloric acid, and at least another inorganic acid;

a non-aqueous composition of an alcohol, carbonic acid, and at least another inorganic acid;

a non-aqueous composition of an alcohol, sulfurous acid, and at least one inorganic acid.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 1, 9, 22, 39, 83, and 89-93 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, "An etching composition consisting essentially of: a non-aqueous composition of an alcohol and at least two inorganic acid, wherein one of the said inorganic acids is selected from the group consisting of sulfuric, boric, carbonic, perchloric, and sulfurous acid;

In claim 9, "An etching composition consisting essentially of: a non-aqueous composition of an alcohol at least two inorganic acids, wherein said inorganic acids are selected from the group consisting of nitric, phosphoric, sulfuric, boric, carbonic, perchloric, and sulfurous acid";

In claim 22, "an etching composition consisting essentially of: a non-aqueous composition of an alcohol at least two different inorganic acids selected from the group consisting of phosphoric, sulfuric, boric, carbonic, perchloric, and sulfurous acid";

In claim 39, "A composition . . . consisting essentially of: a non-aqueous composition comprising propylene glycol, nitric acid and hydrofluoric acid . . .";

In claim 83, "An etching composition consisting essentially of: a non-aqueous composition of propylene glycol and at least two inorganic acids, wherein one of said inorganic acids is selected from the group consisting of hydrofluoric, phosphoric, sulfuric, boric, carbonic, perchloric, and sulfurous acid;

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In claim 89, "An etching composition consisting essentially of: a non-aqueous composition of an alcohol, sulfuric acid, and at least another inorganic acid;

In claim 90, "An etching composition consisting essentially of: a non-aqueous composition of an alcohol, boric acid, and at least another inorganic acid";

In claim 91, "A non-aqueous composition consisting essentially of an alcohol, perchloric acid, and at least another inorganic acid;

In claim 92, "A non-aqueous composition consisting essentially of an alcohol, carbonic acid, and at least another inorganic acid";

In claim 93, "A non-aqueous composition of an alcohol, sulfurous acid, and at least one inorganic acid."

For search and examination purposes, absent a clear indication in the specification of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., PPG, 156 F.3d at 1355, 48 USPQ at 1355 ("PPG could have defined the scope of the phrase consisting essentially of for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention."). When an applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of," applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13-15 and 39-41 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, the ratio of alcohol to a first acid to a second acid is from about 10-50:5-40:1;

In claim 14, the ratio of alcohol to said first acid to said second acid is from about 20-40:10-30:1;

In claim 15, the ratio of alcohol to said first acid to said second acid is from about 30:20:1;

In claim 39, a ratio of propylene glycol to nitric acid to hydrofluoric acid is from about 10-50:5-40:1;

In claim 40, the ratio of propylene glycol to nitric acid to hydrofluoric acid is from about 20-40:10-30:1; and

In claim 41, the ratio of propylene glycol to nitric acid to hydrofluoric acid is from about 30:20:1, is indefinite for failing to specify the units of the ratio. It is unclear what property (i.e. concentration, flow, weight) of the etchants is being compared.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al. (US 5,336,425).

Aoki teaches, "the acidic liquid aluminum cleaner as follows: . . . comprises at least one selection from phosphoric acid, sulfuric acid, and nitric acid; . . . C<sub>2</sub> to C<sub>10</sub> glycols such as propylene glycol, ethylene glycol, diethylene glycol, . . . (column 2, lines 6-12 and 21-21-23). Since Aoki teaches the same components (alcohols and acids) as those of the claimed invention, then using Aoki's composition in the same manner as the claimed invention would inherently result in an etching composition and read on the composition consisting essentially of: a non-aqueous composition of an alcohol and at least two inorganic acids, and further reads on,

wherein one of said inorganic acids is selected from the group consisting of sulfuric acid, **in claim 1;**

said alcohol is a polyhydric alcohol, **in claim 2;**

said polyhydric alcohol is selected from the group consisting of the propylene glycol, **in claims 2-5; and**

said alcohol encompasses said alcohol having a C<sub>2</sub>-C<sub>6</sub> alcohol, **in claim 6.**



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9. Claims 22-27 and 83 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al. (US 5,336,425).

Aoki teaches, "the acidic liquid aluminum cleaner as follows: . . . comprises at least one selection from phosphoric acid, sulfuric acid, and nitric acid; . . . C<sub>2</sub> to C<sub>10</sub> glycols such as propylene glycol, ethylene glycol, diethylene glycol, . . . (column 2, lines 6-12 and 21-21-23). Since Aoki teaches the same components (alcohols and acids) as those of the claimed invention, then using Aoki's composition in the same manner as the claimed invention would inherently result in an etching composition and read on the etching solution consisting essentially of: a non-aqueous composition of an alcohol and at least two different inorganic acids, wherein one of said inorganic acids is selected from the group consisting of sulfuric acid, **in claim 22**;

said alcohol is a polyhydric alcohol, **in claim 23**;

said polyhydric alcohol is selected from the group consisting of the propylene glycol, **in claims 24-26**; and

said alcohol encompasses said alcohol having a C<sub>2</sub>-C<sub>6</sub> alcohol, **in claim 27**.

Also, Since Aoki teaches the same components (alcohols and acids) as those of the claimed invention, then using Aoki's composition in the same manner as the claimed invention would inherently result in a etching composition and read on the etching solution consisting essentially of: a non-aqueous composition of propylene glycol and at least two inorganic acids, wherein one of said inorganic acids is selected from the group consisting of phosphoric and sulfuric acid, **in claim 83**

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10. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Takeuchi (US 5,017,513).

Takeuchi teaches removing a foreign film from a semiconductor structure by immersing the semiconductor structure in a solution of phosphoric acid, hydrofluoric acid and an alcohol (column 4, lines 25-27), which reads on a non-aqueous composition consisting essentially of an alcohol and at least two inorganic acids, wherein one of said inorganic acids is selected from the group consisting of phosphoric acid.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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13. Claims 13-15 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US '425) as applied to claim 1 and 22 respectively above, and further in view of Uchida et al. (US 5,307,296).

Takeuchi differs in failing to specify the ratio of alcohol to a first and to a second acid as recited in claims 13-15.

Uchida teaches, ". . . process conditions or parameters that affect the rate or degree of the process. For example, in wet etching, . . . the concentration (same as applicant's ratio of the etchant components) of the etchant, and other conditions influence the rate of etching" (column 7, lines 3-8), which provides evidence that the ratio of the etchant composition is a so-called "result effective variable," which can be varied to influence the etching rate.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed to modify Takeuchi's etchant by varying the composition of the etchant components as taught by Uchida, since it has been held discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

14. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US '425) further in view of Uchida ('US 296).

Aoki teaches, "the acidic liquid aluminum cleaner as follows: . . . comprises at least one selection from phosphoric acid, sulfuric acid, and nitric acid; . . . C<sub>2</sub> to C<sub>10</sub> glycols such as propylene glycol, ethylene glycol, diethylene glycol, . . . (column 2, lines 6-12 and 21-21-23). Since Aoki teaches the same components (alcohols and acids) as

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those of the claimed invention, then using Aoki's composition in the same manner as the claimed invention would inherently result in an etching composition and read on the etching solution consisting essentially of: a composition for etching doped polysilicon from a silicon substrate with high selectivity to undoped polysilicon and further read on, a non-aqueous composition comprising propylene glycol, nitric acid and hydrofluoric acid, **in claim 39.**

Aoki differs in failing to specify a ratio of propylene glycol to nitric acid to hydrofluoric acid **as recited in claims 39-41.**

Uchida teaches, ". . . process conditions or parameters that affect the rate or degree of the process. For example, in wet etching, . . . the concentration (same as applicant's ratio of the etchant components) of the etchant, and other conditions influence the rate of etching" (column 7, lines 3-8), which provides evidence that the ratio of the etchant composition is a so-called "result effective variable," which can be varied to influence the etching rate.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed to modify Takeuchi's etchant by varying the composition of the etchant components as taught by Uchida, since it has been held discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

*Lynette T. Umez-Eronini*

ltue

October 22, 2003